

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (Withdrawn): A process for producing lipids containing arachidonic acid comprising the steps of

culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than the optimum growth temperature from the start of culturing or after culturing at the optimum growth temperature, said microorganism being obtained by mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus Mortierella, the genus Conidiobolus, the genus Pythium, the genus Phytophthora, the genus Penicillium, the genus Cladosporium, the genus Mucor, the genus Fusarium, the genus Aspergillus, the genus Rhodotorula, the genus Entomophthora, the genus Echinozporangium or the genus Saprolegnia; and then recovering lipids containing arachidonic acid from the culture.

Claim 2 (Withdrawn): The process for producing lipids containing arachidonic acid according to claim 1 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said mutant strain is being cultured

hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 3 (Withdrawn): A process for producing lipids containing arachidonic acid comprising the steps of

culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than 20°C from the start of culturing or after culturing at 20 to 40°C, said microorganism being obtained by the mutagenesis of a microorganism belonging to the subgenus Mortierella; and then

recovering lipids containing arachidonic acid from the culture.

Claim 4 (Withdrawn): The method of producing lipids containing arachidonic acid according to claim 3 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 5 (Withdrawn): A method of producing lipids containing dihomo- γ -linolenic acid comprising the steps of

culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than the optimum growth temperature from the start of culturing or after culturing at the optimum growth temperature, said microorganism being obtained by the mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus Mortierella, the genus Conidiobolus, the genus Pythium, the genus Phytophthora, the genus Penicillium, the genus Cladosporium, the genus Mucor, the genus Fusarium, the genus Aspergillus, the genus Rhodotorula, the genus Entomophthora, the genus Echinosporangium or the genus Saprolegnia; and then recovering lipids containing dihomogamma-linolenic acid from the culture.

Claim 6 (Withdrawn): The method of producing lipids containing dihomogamma-linolenic acid according to claim 5 wherein said mutant strain is a mutant strain in which further Δ 5 desaturase activity has been decreased or is lacking.

Claim 7 (Withdrawn): The method of producing lipids containing dihomogamma-linolenic acid according to claim 5 or 6 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 8 (Withdrawn): A method of producing lipids containing dihomo- γ -linolenic acid comprising the steps of

culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than 20°C from the start of culturing or after culturing at 20 to 40°C, said microorganism being obtained by the mutagenesis of a microorganism belonging to the subgenus Mortierella; and then

recovering lipids containing dihomo- γ -linolenic acid from the culture.

Claim 9 (Withdrawn): The method of producing lipids containing dihomo- γ -linolenic acid according to claim 8 wherein said mutant strain is a mutant strain in which further Δ 5 desaturase activity has been decreased or is lacking.

Claim 10 (Withdrawn): The method of producing lipids containing dihomo- γ -linolenic acid according to claim 8 or 9 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 11 (Previously Presented): An isolated arachidonic acid-containing microbial lipid containing 72% by weight or more of arachidonic acid to the total fatty acids in said

lipid, wherein said lipid is ~~obtainable~~ obtained by extracting microbial cells with an organic solvent, and wherein the percentage of eicosapentaenoic acid to the total fatty acids in said lipid is 0.5% by weight or less.

Claim 12 (Canceled).

Claim 13 (Withdrawn): A microorganism wherein ω 3 desaturase activity has been decreased or is lacking, said microorganism being obtained by the mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus Mortierella, the genus Conidiobolus, the genus Pythium, the genus Phytophthora, the genus Penicillium, the genus Cladosporium, the genus Mucor, the genus Fusarium, the genus Aspergillus, the genus Rhodotorula, the genus Entomophthora, the genus Echinozporangium or the genus Saprolegnia.

Claim 14 (Withdrawn): The microorganism according to claim 13 wherein ω 3 desaturase activity has been decreased or is lacking, wherein said microorganism capable of producing arachidonic acid that is subjected to mutagenesis is a microorganism belonging to the genus Mortierella subgenus Mortierella.

Claim 15 (Withdrawn): The microorganism according to claim 14 wherein ω 3 desaturase activity has been decreased or is lacking, wherein said microorganism, capable of producing arachidonic acid, that is subjected to mutagenesis is Mortierella alpina.

Claim 16 (Withdrawn): The microorganism according to claim 15 wherein ω 3 desaturase activity has been decreased or is lacking, wherein said microorganism wherein ω 3 desaturase activity has been decreased or lacked is Mortierella alpina SAM2153 (FERM BP-6794).

Claim 17 (Previously Presented): An isolated arachidonic acid-containing lipid ~~containing arachidonic acid~~, wherein the arachidonic acid content ~~in~~ to the total fatty acids ~~acid~~ in the lipid is 50% by weight or more, wherein the percentage of eicosapentaenoic acid to the total fatty acids in the lipid is 0.5% by weight or less, said lipid being obtained by culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking, wherein said lipid is ~~obtainable~~ obtained by extracting microbial cells with an organic solvent, and further wherein said microorganism is obtained by the mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus *Mortierella*, the genus *Conidiobolus*, the genus *Pythium*, the genus *Phytophthora*, the genus *Penicillium*, the genus *Cladosporium*, the genus *Mucor*, the genus *Fusarium*, the genus *Aspergillus*, the genus *Rhodotorula*, the genus *Entomophthora*, the genus *Echinosporangium* or the genus *Saprolegnia*.

Claim 18 (Canceled).

Claim 19 (Original): A ~~The lipid containing arachidonic acid~~ according to claim 17 ~~or 18~~ wherein the arachidonic acid content in the total fatty acids in the lipid is 60% by weight or more.

Claim 20 (Original): A ~~The lipid containing arachidonic acid~~ according to claim 17 ~~or 18~~ wherein the arachidonic acid content in the total fatty acids in the lipid is 70% by weight or more.

Claims 21-22 (Canceled).

Claim 23 (Withdrawn): A process for producing the arachidonic acid-containing microbial lipid of claim 11 comprising the steps of

culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than the optimum growth temperature from the start of culturing or after culturing at the optimum growth temperature, said microorganism being obtained by mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus Mortierella, the genus Conidiobolus, the genus Pythium, the genus Phytophthora, the genus Penicillium, the genus Cladosporium, the genus Mucor, the genus

Fusarium, the genus Aspergillus, the genus Thodotorula, the genus Entomophthora, the genus Echinosporangium or the genus Saprolegnia; and then

recovering said arachidonic acid-containing microbial lipid from the culture.

Claim 24 (Withdrawn): The process according to claim 23 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 25 (Withdrawn): A process for producing the arachidonic acid-containing microbial lipid of claim 11 comprising the steps of

culturing a microorganism in which $\omega 3$ desaturase activity has been decreased or is lacking at a temperature lower than 20°C from the start of culturing or after culturing at 20 to 40°C, said microorganism being obtained by the mutagenesis of a microorganism belonging to the subgenus Mortierella; and then

recovering said arachidonic acid-containing microbial lipid from the culture.

Claim 26 (Withdrawn): The method according to claim 25 comprising culturing said mutant strain in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in which said

mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 27 (Previously Presented): An isolated arachidonic acid-containing microbial lipid, wherein the arachidonic acid content ~~per~~ to the total fatty acid in the lipid is 50% by weight or more, wherein the percentage of eicosapentaenoic acid to the total fatty acids in the lipid is 0.5% by weight or less, and wherein the lipid is ~~obtainable~~ obtained by culturing a microorganism in which ω 3 desaturase activity has been decreased or is lacking at a temperature lower than the optimum growth temperature from the start of culturing or after culturing at the optimum growth temperature, said microorganism being obtained by mutagenesis of a microorganism capable of producing arachidonic acid and belonging to the genus *Mortierella*, the genus *Conidiobolus*, the genus *Pythium*, the genus *Phytophthora*, the genus *Penicillium*, the genus *Cladosporium*, the genus *Mucor*, the genus *Fusarium*, the genus *Aspergillus*, the genus *Rhodotorula*, the genus *Entomophthora*, the genus *Echinosporangium* or the genus *Saprolegnia*; and then recovering said arachidonic acid-containing microbial lipid from the culture.

Claim 28 (Previously Presented): The lipid according to claim 27, wherein said mutant strain is cultured in a medium containing hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components; or adding to the culture in

which said mutant strain is being cultured hydrocarbons, fatty acids, fatty acid esters, fatty acid salts, or lipids containing them as components, and then further culturing.

Claim 29 (Previously Presented): The lipid according to claim 27, wherein the microorganism in which ω 3 desaturase activity has been decreased or is lacking is cultured at a temperature lower than 20° from the start of culturing or after culturing at 20 to 40°C, said microorganism being obtained by the mutagenesis of a microorganism belonging to the subgenus *Mortierella*.

Claim 30 (Previously Presented): The lipid according to claim 11, wherein the lipid is produced by a microorganism belonging to the genus *Mortierella*.

Claim 31 (Previously Presented): The lipid according to claim 30, wherein the microorganism belonging to the genus *Mortierella* is *Mortierella alpina*.

Claim 32 (Previously Presented): The lipid according to claim 17, wherein the lipid is produced by a microorganism belonging to the genus *Mortierella*.

Claim 33 (Previously Presented): The lipid according to claim 32, wherein the microorganism belonging to the genus *Mortierella* is *Mortierella alpina*.

Claim 34 (Previously Presented): The lipid according to claim 27, wherein the microorganism belongs to the genus *Mortierella*.

Claim 35 (Previously Presented): The lipid according to claim 34, wherein the microorganism belonging to the genus *Mortierella* is *Mortierella alpina*.

Claim 36 (Previously Presented): The lipid according to claim 35, wherein said *Mortierella alpina* is *Mortierella alpina* FERM BP-6794.

Claim 37 (Previously Presented): The lipid containing arachidonic acid according to claim 33, wherein said *Mortierella alpina* is *Mortierella alpina* FERM BP-6794.